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HYDRAULIC JACK (FLYING CONTROLS) DOWTY AEROSPACE HYDRAULICS Part No 100420001 and 100426001

GENERAL AND TECHNICAL INFORMATION (-1) PARTS CATALOGUE AND RELATED INFORMATION (-3)

BY COMMAND OF THE DEFENCE COUNCIL

Ministry of Defence

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GENERAL

CONTENTS

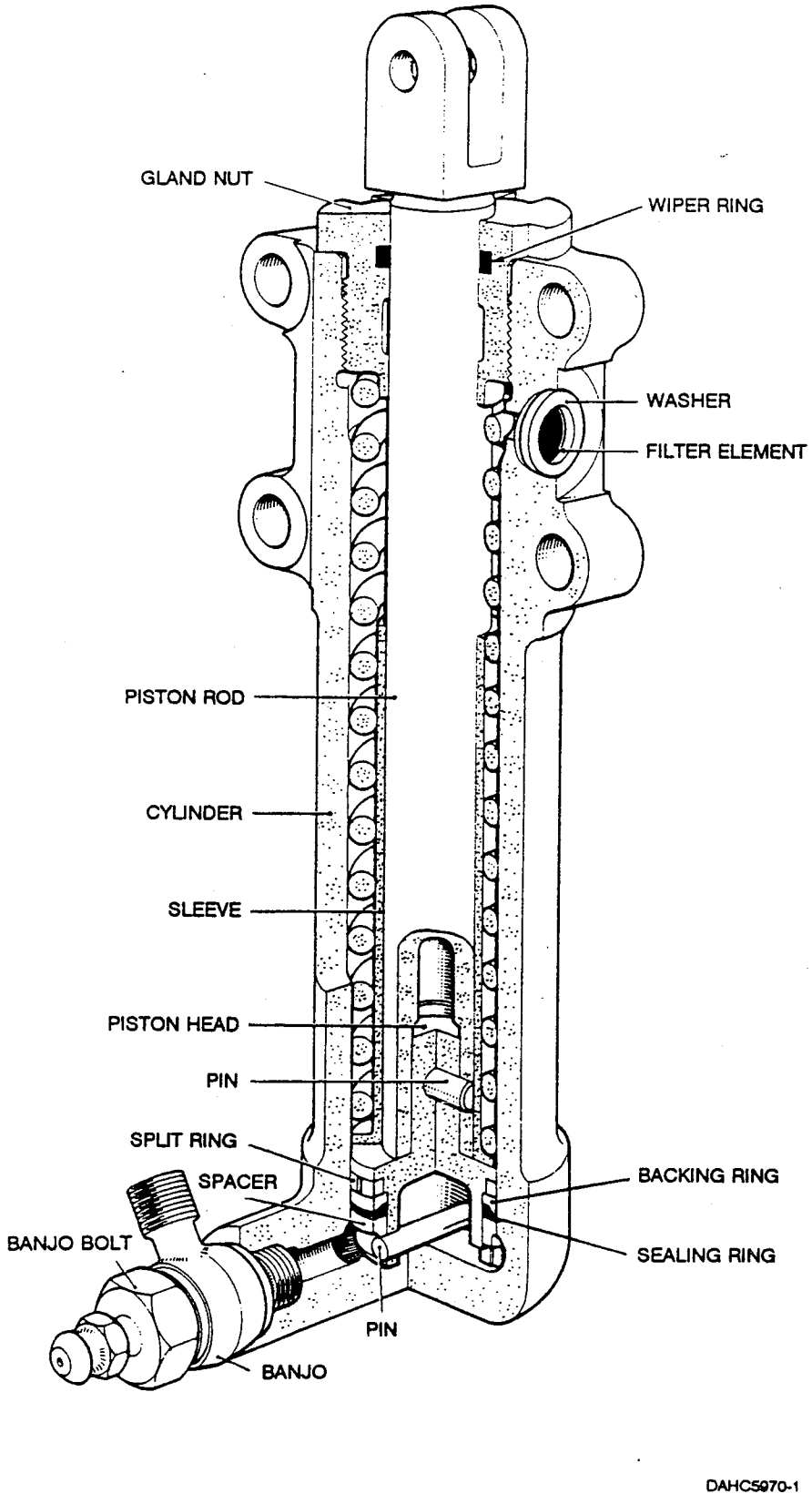

Fig 1 Hydraulic jack

Leading particulars

1 Refer to the appropriate annex for the leading particulars.

Modification state

2 Refer to the appropriate annex for the relevant modification state.

Introduction

3 This hydraulic jack is fitted in the flying controls circuit and is therefore to be subjected to duplicate inspections. The hydraulic jack consists of a cylinder containing a spring loaded piston rod supported by a gland nut. A basic type is described and illustrated in the general text and variants are covered in the annexes.

Constructional description (Fig 1)

4 The piston head, which is fitted with a split ring, a sealing ring, a backing ring and a spacer retained by a pin, is secured by a pin in one end of the piston rod. The opposite end of the piston rod has an integral fork end. A sleeve and a spring are located over the piston rod, the sleeve acting as a seat for the spring and a travel stop for the piston rod on extension.

5 One end of the cylinder is closed and receives the fluid connection which consists of a banjo and bonded seals secured by a banjo bolt. The opposite end has bosses drilled for airframe attachment points and also houses a sealed gland nut which retains the piston assembly. A breather hole between the bosses communicates with the cylinder bore and is fitted with a filter element and retaining washer.

Functional description (Fig 1)

6 The hydraulic jack is hydraulically operated only during the extending stroke, when a spring is compressed to return the piston to the closed position on release of the hydraulic pressure.

MAINTENANCE

Special tools and equipment

7 The following special tools, equipment and materials are required to carry out the maintenance procedures detailed.

Part No	Description	Application
ST111MK23	Tommy bar	Dismantling/Assembling
ST2533	Sleeve	Assembling
ST2824	Spring compressor	Dismantling/Assembling
ST2827	Tubular key spanner	Dismantling/Assembling
-	Trichloroethane (TS367D)	Cleaning
-	White spirit (BS245)	Cleaning
-	Oil OM15 (DTD585)	Assembling
-	Grease XG287 (DEF STAN 91-53)	Assembling
-	Grease XG315 (DEF STAN 91-56)	Assembling
-	Corrosion preventative PX1	Preservation
-	Locking wire (DTD189A)	Locking parts

Safety and maintenance notes

8 Safety and maintenance notes or other general safety/maintenance requirements appropriate to the equipment, or to the main equipment, must be complied with where relevant throughout the work detailed in this publication.

BAY MAINTENANCE

Dismantling (Fig 1)

WARNING

SPECIFIC INTERNAL DETAILS OF THIS UNIT ARE SUBJECT TO SPRING PRESSURE AND CARE MUST BE EXERCISED WHEN DISMANTLING.

9 Discard all forms of sealing rings and the wiper ring after removal from the unit.

9.1 Remove the bleed screw, banjo bolt, bonded seals and the banjo.

9.2 Unscrew the gland nut from the cylinder, using the tubular key spanner ST2827 and tommy bar ST111MK23, and withdraw the piston assembly.

9.3 Fit the spring compressor ST2824 to the piston assembly and compress the spring sufficiently to slide the sleeve up the piston rod and uncover the piston head attachment pin.

9.4 Remove the pin and withdraw the piston head from the end of the piston rod. Remove the spring compressor.

9.5 Remove the pin, the spacer, the sealing ring, the backing ring and the split ring from the piston head.

9.6 Slide the sleeve, the spring and the gland nut from the piston rod. Remove the wiper ring.

9.7 Remove the peening at the cylinder breather hole and remove the washer and the filter element.

Cleaning

WARNING

CLEANING AGENT SHOULD BE USED IN A WELL VENTILATED AREA, AWAY FROM NAKED FLAMES. CARE SHOULD BE TAKEN NOT TO BREATHE THE FUMES OR ALLOW UNDUE CONTACT WITH THE SKIN.

CAUTION

Chlorinated solvents can combine with minute amounts of water found in operating hydraulic systems to form hydrochloric acid which will corrode internal metallic surfaces. It is imperative that all internal surfaces are dry and free from any traces of residual solvent prior to assembly and installation. For those applications where it is difficult to remove all traces of solvent, clean unused white spirit is recommended.

10 To enable all items to be visually examined for damage and wear, each part must be thoroughly cleaned using the appropriate cleaning agents and methods. When cleaning is completed, parts must be dried using compressed air; clean, lint-free cloth or tissues and all subsequent handling must be with clean PVC or polythene gloves. If delays occur before assembly, parts must be suitably protected against corrosion using temporary corrosion preventative PX1.

Examination and checking

11 Visually examine all parts for damage and corrosion. Check parts for permissible wear in accordance with fits and clearances paragraph 14.

Superficial damage

12 Superficial damage in the form of external isolated scores, smooth dents and abrasions free from cracks are to be regarded as negligible provided that internal dimensions are not affected and the damage is within the following limits:

12.1 Not exceeding 0.500 in long.

12.2 Not exceeding 0.010 in deep.

12.3 Not less than 0.250 in from any hole or bearing surface.

NOTE

Burrs must be removed and sharp edges blended out. Minor scores and abrasions in non-sealing bores may be ignored provided that proud portions of the abrasion are removed.

Checking data

13 Spring 500Y624

13.1 Number of working coils: 23

13.2 Wire size: 0.144 in (9 SWG)

13.3 Free length: 6.830 in

13.4 Check length: 5.060 and 3.560 in

13.5 Load at check length: 47.500 to 52.500 lbf and 87.880 to 97.120 lbf respectively.

Fits and clearances (Fig 2)

14 Check that the dimensions are within the specified limits.

TABLE 1 FITS, CLEARANCES AND REPAIR TOLERANCES

Ref No on Fig 2	Parts and Description	Dimension New	Permissible Worn Dimension		Permissible Clearance		Remarks
			Interchangeable Assembly	Selective Assembly	New	Worn	
1	PISTON ROD IN GLAND NUT						
	Gland nut i/d	0.68825 / 0.68700	0.69000	0.69000	0.00425 / 0.00100	0.00600	
	Piston rod o/d	0.68600 / 0.68400	0.68400	0.68400			
2	CYLINDER						
	Cylinder i/d	1.1925 / 1.1875	1.196	1.196	-	-	

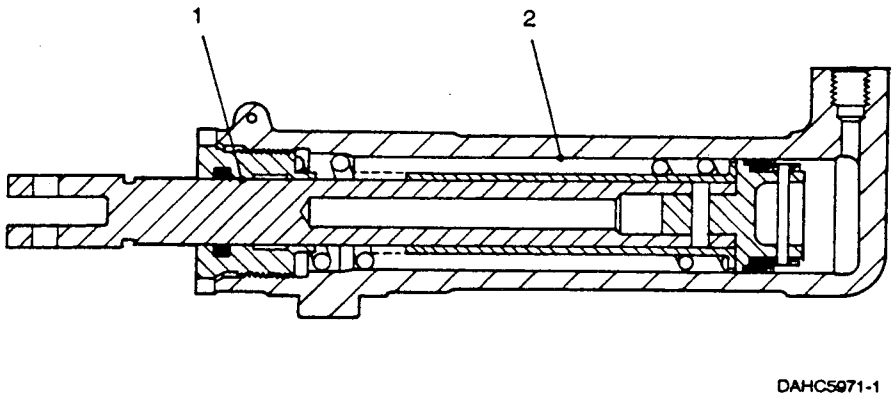

Fig 2 Fits and clearances

Assembling (Fig 1)

CAUTION

Duplicate inspection of assembly of this unit is required throughout the assembly procedure.

15 Lightly lubricate the sealing ring and bonded seals with clean oil OM15 and the wiper ring with grease XG315 before being assembled in the unit.

15.1 Place the filter element and washer in the cylinder breather recess and peen the cylinder metal in two places to retain them.

15.2 Assemble the wiper ring to the gland nut, pack the internal groove of the nut with grease XG287 and apply a liberal, but not excessive, coat of the same grease to the spring. Slide the gland nut on the piston rod followed by the spring and the sleeve.

15.3 Assemble the split ring, the backing ring, the sealing ring and the spacer to the piston head and secure the spacer with the pin. Punch the pin in two places at each end to lock. If a new split ring is fitted, it is to be gapped 0.009 to 0.012 in on assembly and the sharp edges at the gap, on the flat faces only, removed up to a maximum of 1/64 in radius.

NOTE

The backing ring and sealing ring have a lip and external chamfer respectively and must be assembled so that these features are adjacent.

15.4 Fit the spring compressor ST2824 to the piston assembly and compress the spring sufficiently to slide the sleeve up the piston rod and uncover the hole for the piston head attachment pin.

15.5 Secure the piston head in the piston rod with the pin and remove the spring compressor, allowing the sleeve to cover the ends of the pin.

15.6 Insert the piston assembly in the cylinder using the sleeve ST2533 and tightly screw in the gland nut using tubular key spanner ST2827 and tommy bar ST111MK23.

15.7 Put a bonded seal on each side of the banjo and secure the banjo to the cylinder boss with the banjo bolt. Screw the bleed screw into the banjo bolt.

15.8 After satisfactory testing, wirelock the banjo bolt to the cylinder and the gland nut to the cylinder.

TESTING

Special tools and test equipment

16 The following special tools and test equipment are required to carry out the test procedures detailed.

Part No	Description	Application
-	Static hydraulic test rig (with power pump capable of delivery 3.45 gal/min)	Apply hydraulic pressure

Testing the unit (Fig 1)

17 Ensure the unit is hydraulically full and bled free of air. All pipes between the test rig and hydraulic jack must be 3/8 in outside diameter for metal pipes and 3/8 in nominal for flexible hose. Using the equipment specified in paragraph 16, carry out the following test procedure:

17.1 Connect the hand pump supply line of the static hydraulic test rig to the fluid connection and apply pressure to extend the jack. Gradually increase the pressure to 4950 lbf/in^2. Leakage must not occur. Release the pressure and disconnect the supply line.

17.2 Connect the supply line of the power pump rig to the fluid connection and operate the rig. The pressures required to commence and complete the extending movement must not exceed 100 and 130 lbf/in^2 respectively. Release the pressure.

17.3 Repeat the test 17.1 and 17.2 with the piston rod in four positions, approximately at 90 degrees to each other. Check that the piston will return smoothly and without delay to the closed position after releasing the pressure in each position. Disconnect the supply line.

Annex A

HYDRAULIC JACK

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No 100420001

Leading particulars

1 Leading particulars of this unit are as follows:

1.1	System fluid	Oil OM15 (DTD585)
1.2	Stroke	1.460 to 1.540 in max.
1.3	Connection	0.125 in BSP

Modification state

2 The information in this annex includes all appropriate modifications up to and including issue 15.

Introduction

3 This unit is identical to that described and illustrated in the general text.

Annex B

HYDRAULIC JACK

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No 100426001

Leading particulars

1 Leading particulars of this unit are as follows:

1.1	System fluid	Oil OM15 (DTD585)
1.2	Stroke	1.460 to 1.540 in max.
1.3	Connection	0.125 in BSP

Modification state

2 The information in this annex includes all appropriate modifications up to and including issue 7.

Introduction

3 This unit is similar to that described and illustrated in the general text but has a different cylinder which is formed with a triangular forked lug. The breather hole in the cylinder accommodates a screw-in filter sub-assembly and the Dismantling/Assembling procedures should be revised accordingly.

PARTS CATALOGUE AND RELATED INFORMATION

FOR

HYDRAULIC JACK (FLYING CONTROLS)

DOWTY AEROSPACE HYDRAULICS - CHELTENHAM

Part No 100420001 and 100426001

MODIFICATION RECORD

Mod No	AL No	Mod No	AL No	Mod No	AL No	Mod No	AL No	Mod No	AL No	Mod No	AL No
AC4429	*										

* Incorporated in initial issue of Catalogue
NA Mod not applicable to this Catalogue
C Mod cancelled
AS Amendment Sheet

PARTS CATALOGUE AND RELATED INFORMATION (TOPIC 3)

MEMORANDUM OF INSTRUCTIONS

Demands

1 Requirements for demands are:

1.1 The demand must quote the appropriate Reference Number for each item. Unreferenced parts are not normally provisioned as spares and demands for such items must quote the maker's Part Number and the name and type of the equipment. The location of each part within the equipment should be clearly indicated.

1.2 Demands are to be prepared in accordance with the procedure laid down in AP 830 Volume 1 or BR4.

Local manufacture

2 Parts annotated 'LM' are to be manufactured from local resources. If the manufacture of such items is beyond the capacity of the Unit, the demand is to be endorsed 'Unable to manufacture locally'.

Major repair

3 'MR' indicates that an item is required for major repair purposes only and will not normally be held in store by Units other than those authorised to undertake major repair of the equipment.

Units per assembly

4 The number quoted is the quantity required per next higher assembly in the position shown except 'attaching parts' which quote the quantity required to attach one item. The letters 'AR' in the 'Units per Assy' column indicate that the quantity is 'as required'. Where applicable the quantity normally fitted is shown as a nominal figure, eg (Nom 3). Where an item is listed only for reference purposes the letters 'RF' are quoted.

Classification of equipment

5 The Class of Store is indicated by a single letter as laid down in AP 830 Volume 1 or BR4.

Fitting code (FC)

6 The FC is indicated by one of the following letters and is only quoted against parts which are not directly interchangeable:

V Open up holes on assembly
W Partially assembled
X Ream or machine on assembly
Y Drill or drill and tap on assembly
Z Trim on assembly

Obsolescent stock

7 An asterisk in the 'Part No' column indicates that no further purchases of the item will be made but the part is to be used until stocks are exhausted.

Modifications

8 When items are affected by a modification the 'Mod No' is quoted in the description. Modifications incorporated in the catalogue are listed in the Modification Record.

Manufacturers NATO code

9 The NATO supply code for manufacturers is an alpha-numeric code for non-US based approved manufacturers and a numeric code for US based approved manufacturers. Manufacturers details related to a specific code are contained in the following publications available from DCA, Kentigern House, 65 Brown Street, Glasgow G2 8EX.

99-H4-1 Name to Code
99-H4-2 Code to Name

Usage code

10 The usage code column is normally left blank indicating full applicability of all items. Where a code letter is shown, it indicates that all items with that letter form part of the same assembly or sub-assembly.

INDEX OF PART NUMBERS

Part Number	DMC	Reference Number	Fig/Index	C of S or LM	FC
AGS1132A	28F	4730-99-9423236	1-4		
AGS1173A	28F	4730-99-4051838	1-2		
AGS1174	28F	4730-99-9128952	1-1		
AGS1186A		5330-99-9428452	1-3		
AGS596A	28N	5340-99-9128964	1-24		
C7889Y20			1-22A		
C7889Y21			1-22		
C8767Y2			1-19C		
C8767Y3			1-19B		
C8767Y4			1-18		
D7095Y7	27Q	4320-99-4118405	1-23		
D7889Y22			1-19		
D7889Y23			1-19A		
SP13G	28W	5310-99-9419403	1-20		
SP584-94	27Q	5310-99-4118389	1-17		
SP836-73	27Q	4320-99-4118392	1-13		
SP880A	27QA	5330-99-1029282	1-25		
100420001	27QM	4320-99-4118381	1		
100420100			1-6		
100426001	27QM	4320-99-4118403	1		
100426100			1-6A		
11879Y002	27Q	1620-99-4118390	1-12		
11879Y003	27Q	5310-99-4118391	1-11		
11879Y004	27Q	5365-99-4118395	1-10		
2000Y135		4820-99-4118102	1-5		
500Y624	27Q	5360-99-4118396	1-15		
507Y17	27Q	4320-99-4118383	1-21		
7889Y16	27Q	4320-99-4118385	1-8		
7889Y18	27Q	5315-99-4118388	1-9		
7889Y5	27Q	4320-99-4118386	1-16		
7889Y6	27Q	4320-99-4118394	1-14		
7889Y7	27Q	5315-99-4118387	1-7		

DETAILED PARTS LIST

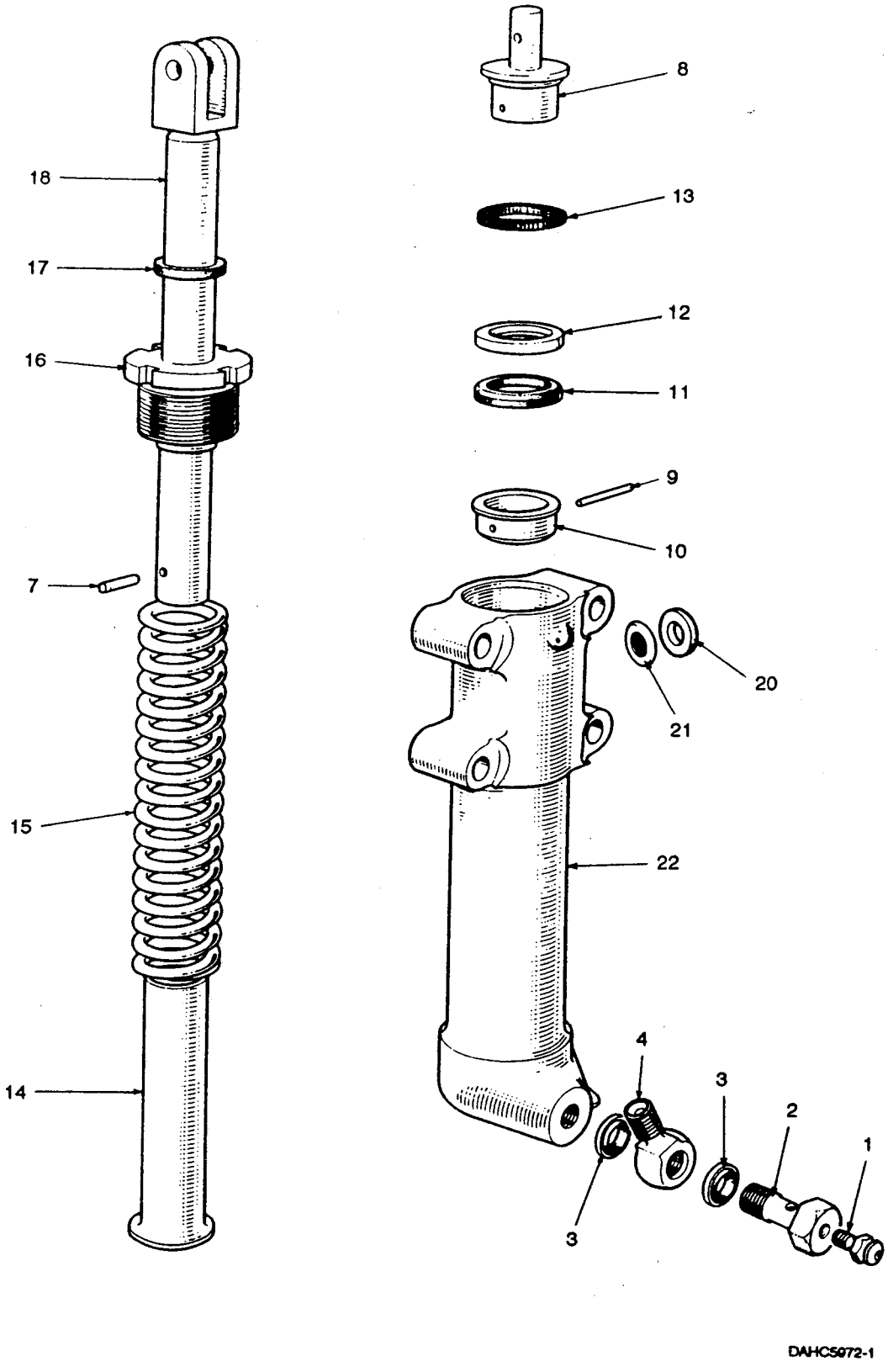

Fig 1 Hydraulic jack

HYDRAULIC JACK

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1	100420001	Jack, hydraulic (Mod AC4429)		A	RF
1+	100426001	Jack, hydraulic (Mod AC4429)		B	RF
-1	AGS1174	. Screw, bleed			1
-2	AGS1173A	. Bolt, banjo			1
-3	AGS1186A	. Seal, bonded			2
-4	AGS1132A	. Banjo			1
-5+	2000Y135	. Transfer			1
-6+	100420100	. Jack sub-assembly		A	1
-6A+	100426100	. Jack sub-assembly		B	1
-7	7889Y7	. . Pin			1
-8	7889Y16	. . Head, piston			1
-9	7889Y18	. . Pin			1
-10	11879Y004	. . Spacer			1
-11	11879Y003	. . Ring, sealing			1
-12	11879Y002	. . Ring, backing			1
-13	SP836-73	. . Ring, split			1
-14	7889Y6	. . Sleeve			1
-15	500Y624	. . Spring			1
-16	7889Y5	. . Nut, gland			1
-17	SP584-94	. . Ring, wiper			1
-18	C8767Y4	. . Rod, piston			1
-19+	D7889Y22	. . Cylinder sub-assembly (Alternative)		A	1
	or				
-19A+	D7889Y23	. . Cylinder sub-assembly		A	1

+ Item not illustrated

HYDRAULIC JACK

Fig/ Index No	Part No	1 2 3 4 5 6 Nomenclature	Mnfrs NATO Code	Usage Code	Units per Assy
1-19B+	C8767Y3	. . Cylinder		B	1
	or	(Alternative)			
-19C+	C8767Y2	. . Cylinder		B	1
-20	SP13G	. . . Washer		A	1
-21	507Y17	. . . Element, filter		A	1
-22	C7889Y21	. . . Cylinder		A	1
	or	(Alternative)			
-22A+	C7889Y20	. . . Cylinder		A	1
-23+	D7095Y7	. . Filter sub-assembly		B	1
-24+	AGS596A	. Cap, dust (Storage and transit)			1
-25+	SP880A	. Washer, sealing (Storage and transit)			1

+ Item not illustrated